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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/758,522 | 01/15/2004 | Chris E. Geswender | PD-03W114 | 6341 |

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02/10/2006

Patent Docket Administration
RAYTHEON COMPANY
Bldg. EO/E4/N119
P.O. Box 902
El Segundo, CA 90245

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| EXAMINER |
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RADI, JOHN A

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| ART UNIT | PAPER NUMBER |
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3641

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/758,522 | GESWENDER ET AL. | |
| | Examiner | Art Unit | |
| | John A. Radi | 3641 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 14-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/15/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-13, are drawn to a method for correcting range and deflection errors in projectiles, classified in class 244, subclass 3.1.
- II. Claims 14-30, are drawn to a corrector for correcting range and deflection errors in projectiles, classified in class 244, subclass 3.24.
- III. Claims 31-42, are drawn to a modified fuze kit, classified in class 244, subclass 3.23.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case invention I doesn't need either the receiver for receiving the position of the projectile, or an onboard flight computer, as the method can be accomplished by an off-board correction system.

Inventions I and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case invention I

doesn't need either the receiver for receiving the position of the projectile, or an onboard flight computer, as the method can be accomplished by an off-board correction system.

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as a correction device that can be adapted onto the base of the projectile as opposed to a replacement of the fuze kit. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Thomas J. Finn on December 7th a provisional election was made without traverse to prosecute the invention I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-42 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1, 7, 8, 10-12 are is rejected under 35 U.S.C. 102(b) as being anticipated by Teter et al. (US 6502785).

Teter discloses a method for correcting the range and deflection errors in a spin or fin stabilized projectile by: determining deviations of the projectile from a ballistic trajectory in a downrange and crossrange dimension (col. 5 line 58 to col. 6 line 4); and intermittently deploying and stowing (col. 3, lines 43-45) at least one aerodynamic surface (26, 28, 30, 32) to develop a rotational moment (col. 4 lines 31-45 and col. 4 lines 11-22), which creates body lift that nudges the projectile in said crossrange and downrange dimensions to move the projectile to its ballistic trajectory.

With respect to claim 7, wherein the aerodynamic surface has no effect on the ballistic trajectory when stowed (col. 3, lines 46-49).

With respect to claim 8, deploying at a fixed angle of attack, (col. 3, lines 49-54).

With respect to claims 10-12, wherein adjustments are made continuously, or intermittently, or in predetermined stages, Teter at col. 5 line 58 to col. 6 line 4 discusses the different types of controllers and adjustments that can be used with their flap control system.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teter (US 6502785) as applied to claim 1 above, and further in view of Hakenesch US (6283407).

Teter teaches the invention as described above with respect to claim 1, but doesn't teach a control surface that is deployed and retracted over a single or multiple partial roll cycles of the projectile. Hakenesch teaches the control of an aerodynamic vehicle by deploying and retracting a control surface over a partial roll cycle and repeating the step as necessary to achieve the desired control of the vehicle (col. 2 lines 47-63 which detail how the "strake" is positioned at varying angles depending on its rotational position). Hakenesch provides the motivation for this type of control system being that it can be implemented by means of a relatively low constructive and equipment related expenditures and provides a considerable control potential (col. 2 first paragraph). Therefore it would have been obvious to one skilled in the art at the time of invention to combine the control surfaces and method taught by Hakenesch with the missile as taught by Teter.

With respect to claim 13, the use of a voice coil or solenoid to deploy the aerodynamic surfaces, while Teter in view of Hakenesch don't specifically mention the type of actuators used, Hakenesch states that the actuators can be any according to the state of the art. The examiner takes official notice that the use of a voice coil (or solenoid) is well known in the art or actuators and allows for movement in situations where precision or space is a critical factor. Therefore it would have been obvious to one skilled in the art at the time of invention to select from one of the actuating methods

available, and therefore use a voice coil to actuate the aerodynamic surfaces taught by Teter in view of Hakenesh.

Claims 1, 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leek (US 4113204) in view of Teter (US 6502785).

Leek discloses a method for correcting the range and deflection errors in a fin stabilized projectile. Leek is a control system for guided missiles and while it doesn't disclose the methods by which it determines the deviations from its intended trajectory, it is inherent that a guided system operates by determining such deviations and making course corrections to get to its intended target.

Furthermore, once Leek determines the deviation from its intended trajectory, Leek intermittently deploys or stows (figure 1 shows deploy and stowing positions) at least one aerodynamic surface (11) to develop a rotational moment (col. 2 lines 45-48), which creates body lift that nudges the projectile in said crossrange and downrange dimensions to move the projectile to its ballistic trajectory.

With respect to claim 4 and 5, nudging the missile in the same plane or orthogonally to the plane of aerodynamic surface, col. 2 line 4 to col. 3 line 31 details how the 3 control surfaces can be deployed independently of each other to create pitch, yaw and roll vectors to move the missile in any direction desired – either in the same plane or orthogonally to the plane of the aerodynamic surfaces.

With respect to claim 6, and 10-12, Leek discloses the way in which the control surfaces can be used to guide a projectile to its intended target but doesn't go into specifics regarding the means of initially firing the projectile or the guidance computer.

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Teter as discussed above, teaches the alternative use of various control systems and methods of making course corrections (Teter col. 5 line 58 to col. 6 line 4). Leek was designed to be used with a course correcting system to ensure the course of the projectile stays on course therefore providing the motivation to seek out one of the course correcting systems taught by Leek. Therefore, it would have been obvious to one skilled in the art at the time of invention to combine one of the course correcting systems taught by Teter with the control surfaces taught by Leek to achieve the invention as disclosed by applicants claims 6 and 10-12.

With respect to claim 7 and 9, the aerodynamic surfaces of Leek fully retract into the body and have no effect on the ballistic trajectory when stowed (figure 1, and col. 2 lines 38-42), and can be rotated between a fully deployed, fully stowed, and again to a fully deployed position (figure 1).

With respect to claim 8, the aerodynamic surfaces are deployed at a fixed angle of attack, as can be seen from figure 1, regardless of how much of the control surface is deployed it is always at the same angle of attack with respect to the length of the projectile.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See attached form PTO-892 with respect to other projectile trajectory correction systems. Particular attention is drawn to Sallee et al. (US 5788180) which teaches the use of a voice coil to change the rotational moment of an

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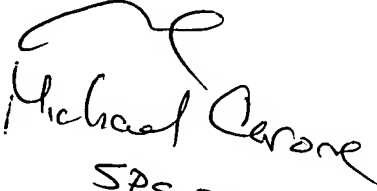
artillery projectile to create a desired lift and thereby keep the projectile on the desired trajectory (col. 2, lines 4-9)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Radi whose telephone number is 571-272-5883. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J. Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John A. Radi
Patent Examiner
Art Unit 3641


Michael Carone
SPE 3641